WE CLAIM:

1. A serial digital communication system, comprising:

a master device having an input and an output; and

a plurality of slave devices connected serially between said master device's output and input thereby forming a closed chain;

each of said slave devices arranged to transmit a predetermined number of pulse-width-modulated (PWM) pulses to the device immediately following it in the chain upon receipt of an end-of-transmission (EOT) signal from the device immediately preceding it in the chain, and to transmit an EOT signal when the transmission of said predetermined number of PWM pulses is completed;

said master device arranged to transmit an EOT signal to initiate said transmission of PWM pulses;

each of said slave devices further arranged to passively buffer PWM pulses received from the slave device immediately preceding it in the chain such that each device's PWM pulses are transmitted in one direction sequentially to the input of said master device via the intervening slave devices, such that, upon transmitting said EOT signal, said master device receives a continuous stream of PWM pulses followed by a single EOT signal.

2. The system of claim 1, wherein said EOT signal comprises one or more pulses having characteristics which are clearly distinguishable from those of said PWM pulses.

3. The system of claim 2, wherein said EOT signal comprises a single high-going pulse which has a

predetermined pulse width, and said PWM pulses have a minimum pulse "high" time which is greater than said predetermined pulse width.

4. The system of claim 1, wherein said predetermined number of PWM pulses is one.

5. The system of claim 1, wherein each slave device transmits an equal number of PWM pulses upon receipt of an EOT pulse.

6. The system of claim 1, wherein each slave device transmits a respective number of PWM pulses upon receipt of an EOT pulse, wherein said respective numbers need not be equal.

7. The system of claim 1, wherein said system is arranged such that each of said slave devices is powered down after transmitting an EOT pulse.

8. The system of claim 1, wherein said EOT signal comprises a single high-going pulse which has a predetermined pulse width, and said PWM pulses have a minimum pulse "high" time which is greater than said predetermined pulse width, each of said slave devices comprising:

an input for connection to the output of the device immediately preceding it in the chain and an output for connection to the input of the device immediately following it in the chain;

a PWM pulse detector connected to said slave device input which detects when an incoming high-going pulse has a "high" time greater than said minimum pulse "high" time;

a PWM pulse generator arranged to generate said

predetermined number of PWM pulses at an output upon receipt of a high-going pulse at said slave device input and to immediately terminate said generation of said PWM pulses if said PWM pulse detector detects that an incoming high-going pulse has a "high" time greater than said minimum pulse "high" time; and

a logic gate connected to said device input and to said PWM pulse generator output at respective inputs and which produces a high-going output when either of said logic gate inputs goes high;

such that said slave device passively buffers PWM pulses received from the device immediately preceding it in the chain to said slave device output and generates said predetermined number of PWM pulses at said PWM pulse generator output and said slave device output when said PWM pulse detector detects that an incoming high-going pulse has a "high" time less than said minimum pulse "high" time.

9. The system of claim 8, wherein said PWM pulse detector comprises:

an input coupled to said device input;

an output coupled to said PWM pulse generator;

an RC network connected to said PWM pulse detector input and produces an output which increases at a rate that varies with the resistance and capacitance values of said RC network upon receipt of a high-going pulse at said PWM pulse detector input; and

a logic gate connected to said PWM pulse detector input and said RC network output and which produces a high-going output when both of said logic gate inputs are high.

10. The system of claim 1, wherein the duty ratios of said PWM pulses represent respective analog values.

11. The system of claim 1, wherein said analog values

represent temperatures.

12. The system of claim 1, wherein the duty ratios of said PWM pulses represent respective binary values.

13. The system of claim 1, wherein each of said slave devices is further arranged to transmit a start-of-transmission (SOT) signal immediately prior to transmitting said predetermined number of pulse-width-modulated (PWM) pulses, to transmit said EOT pulse when the transmission of said SOT signal and said predetermined number of PWM pulses is completed, and to passively buffer the SOT signals and the PWM pulses received from the immediately preceding slave device such that each device's SOT signal and PWM pulses are transmitted in one direction sequentially to the input of said master device via the intervening slave devices, such that, upon transmitting said EOT pulse, said master device receives said predetermined number of PWM pulses from each slave device with each set of PWM pulses preceded by a SOT signal, followed by a single EOT signal.

14. The system of claim 13, wherein said EOT signal comprises a single high-going pulse which has a predetermined pulse width, said PWM pulses have a minimum pulse "high" time which is greater than said predetermined pulse width and a maximum pulse "high" time, and said SOT signal comprises a pulse having a pulse "high" time greater than said maximum pulse "high" time.

15. A serial digital communication system, comprising:

a master device having an input and an output; and

a plurality of slave devices connected serially between said master device's output and input thereby

forming a closed chain;

each of said slave devices arranged to transmit a start-of-transmission (SOT) signal followed by zero or more pulse-width-modulated (PWM) pulses to the device immediately following it in the chain upon receipt of an end-of-transmission (EOT) signal from the device immediately preceding it in the chain, and to transmit an EOT signal when the transmission of said SOT signal and said PWM pulses is completed;

said master device arranged to transmit a EOT signal to initiate said transmission of SOT signals and PWM pulses;

each of said slave devices further arranged to passively buffer the SOT signals and the PWM pulses received from the immediately preceding slave device such that each device's SOT signal and PWM pulses are transmitted in one direction sequentially to the input of said master device via the intervening slave devices, such that, upon transmitting said EOT signal, said master device receives said PWM pulses from each slave device with each device's PWM pulses preceded by a SOT signal, followed by a single EOT signal.

16. The system of claim 15, wherein said EOT signal comprises a single high-going pulse which has a predetermined pulse width, said PWM pulses have a minimum pulse "high" time which is greater than said predetermined pulse width and a maximum pulse "high" time, and said SOT signal comprises a pulse having a pulse "high" time greater than said maximum pulse "high" time.

17. A method of transferring data from a plurality of slave devices connected serially in a closed chain between a master device's output and input, comprising:

configuring each of said slave devices to

transmit respective data to the device immediately following it in the chain upon receipt of an end-of-transmission (EOT) signal from the device immediately preceding it in the chain, and to transmit an EOT signal when the transmission of said data is completed;

transmitting an EOT signal to the first slave device in said chain to initiate said transmission of data;

passively buffering data received from an immediately preceding slave device such that each slave device's data is transmitted in one direction sequentially to the input of said master device via the intervening slave devices, such that, upon transmitting said EOT pulse, said master device receives a continuous stream of data followed by a single EOT signal.

18. The method of claim 17, wherein said respective data is a predetermined number of pulse-width-modulated (PWM) pulses.

19. The method of claim 18, wherein said EOT signal comprises a single high-going pulse which has a predetermined pulse width, and said PWM pulses have a minimum pulse "high" time which is greater than said predetermined pulse width.

20. The method of claim 18, further comprising encoding analog values as respective PWM pulses.

21. The method of claim 18, further comprising encoding binary values as respective PWM pulses.

22. The method of claim 17, further comprising powering down a slave device after it transmits said EOT signal.